Name: Date:

Polynomial Factoring solution (version 677)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 112}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-96}}{2}$$

$$x = \frac{4 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{4 \pm 4\sqrt{6}\, i}{2}$$

$$x = 2 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 - 9i$ and $6 + 8i$ in standard form ($a + bi$).**

Solution

$$(-3 - 9i) \cdot (6 + 8i)$$

$$-18 - 24i - 54i - 72i^2$$

$$-18 - 24i - 54i + 72$$

$$-18 + 72 - 24i - 54i$$

$$54 - 78i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 13x + 10$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	2	-13	10
-5		-5	15	-10
	1	-3	2	0

$$f(x) = (x + 5)(x^2 - 3x + 2)$$

$$f(x) = (x + 5)(x - 1)(x - 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 7)^2 \cdot (x + 3) \cdot (x - 1)$$

Sketch a graph of polynomial $y = p(x)$.